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# United States Patent

Shiga et al.

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[54] STARTER

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[58] Field of Search 290/38 R, 38 A, 290/38 C, 38 B, 48; 74/6, 7 A, 7 R, 7 E

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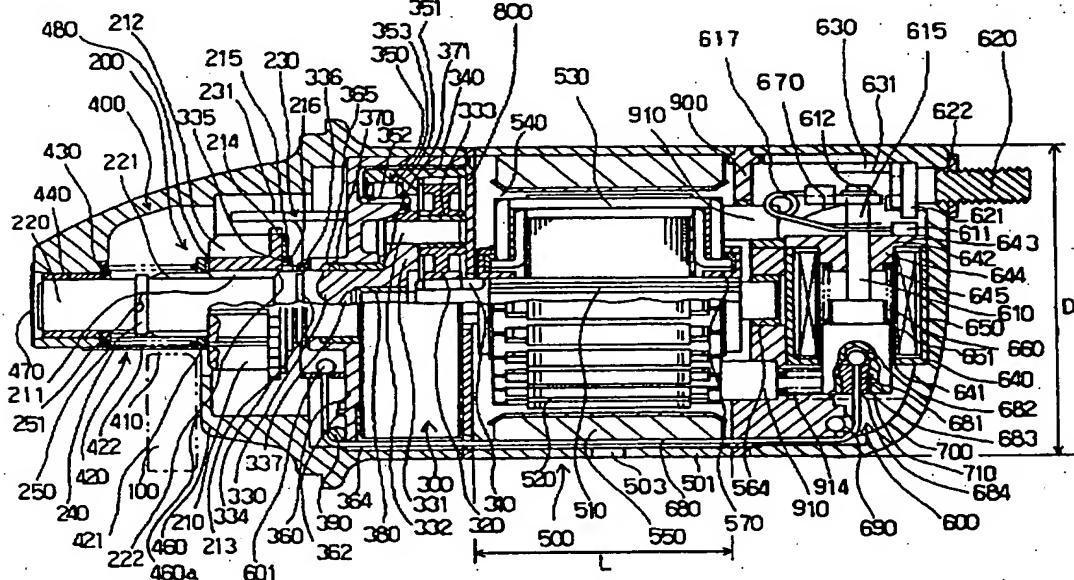
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[57]

ABSTRACT

A starter is provided that includes a starter motor having an armature core with an armature coil wound therearound and an armature shaft for rotatably holding the armature core. A drive shaft is further provided having a pinion that meshes with a ring gear of an engine. A reduction gear mechanism is interposed between the drive shaft and the armature shaft for reducing the rotation relative to the armature shaft to transmit the reduction rotation to the drive shaft. The reduction gear mechanism has a speed reduction ratio of 6:1 to 10:1.

11 Claims, 21 Drawing Sheets



### ABSTRACT

A starter is provided that includes a starter motor having an armature core with an armature coil wound therearound and an armature shaft for rotatably holding the armature core. A drive shaft is further provided having a pinion that meshes with a ring gear of an engine. A reduction gear mechanism is interposed between the drive shaft and the armature shaft for reducing the rotation relative to the armature shaft to transmit the reduction rotation to the drive shaft. The reduction gear mechanism has a speed reduction ratio of 6:1 to 10:1.